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PRINCE WILLIAM SOUND MANAGEMENT AREA
1994 SHELLFISH ANNUAL MANAGEMENT REPORT

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INTRODUCTION

This report documents the most recently completed shellfish fisheries in the Prince William Sound (PWS) Management Area (Area E) which is comprised of all waters of Prince William Sound and the Gulf of Alaska from Cape Suckling to the east and Cape Fairfield to the west. The fisheries are the 1994 sidestripe shrimp *Pandalopsis dispar* trawl fishery and the 1994-95 brown king crab fishery *Lithodes aequispina*. Octopus and squid harvested as bycatch in the groundfish and shrimp trawl fisheries are also reported.

The following fisheries are also reviewed in this report although the 1994 - 1995 commercial seasons were not opened. The 1995 Tanner crab *Chionoecetes bairdi*, the 1994 Dungeness crab *Cancer magister*, and the 1994 spot shrimp *Pandalus platyceros* fisheries were closed due to low stock abundance and poor recruitment. The weathervane scallop fishery remained closed due to changes in season dates during the 1994 spring meeting of the Alaska Board of Fisheries.

Shellfish landings from the sidestripe shrimp trawl fishery in Area E during 1994 included 110,863 lb of trawl shrimp. Harvest data from the 1994 brown king crab fishery are confidential. A department policy on confidentiality states that any time a fishery or statistical area has fewer than three participants, catch information may not be made public. Table 1 lists Emergency Orders affecting area fisheries during 1994.

The estimated ex-vessel value for the shrimp trawl fishery was $250,000. Brown king crab fishery value is confidential.

TANNER CRAB FISHERY

Introduction

In the Prince William Sound Management Area, Tanner crabs have historically been the primary shellfish resource in terms of landed weight. Over 74 million lb have been harvested during the past 26 years. Historically, the harvest has been equally divided between the Gulf of Alaska and Prince William Sound (PWS).

The management area is divided into 4 Tanner crab management districts (Figure 1). The Northern and Hinchinbrook Districts include most of the waters inside PWS proper while the Eastern and Western Districts encompass the Gulf of Alaska portion of the management area and southwestern PWS.

The Tanner crab fishery in PWS is classified as "superexclusive". This term means that a boat validly registered to fish in the PWS registration area may not participate in any other Tanner crab fishery within the state during that registration year (August 1 - July 31). Conversely, a boat validly registered to fish in another registration area may not fish in PWS during that registration year. Other regulations unique to the fishery are a 175-pot limit in Area waters west of 146°40' West longitude. East of this line a 100-pot limit is in effect. The minimum legal size limit for Tanner crab in Area E is 135 mm (5.3 in). The fishery regulatory season dates are January 15 - March 31.

Tanner crab fishing began in 1968 when 1.2 million lb were landed. The fishery peaked at 13.9 million lb in the 1972-73 season prior to implementation of the minimum legal size in 1976. The area experienced decreasing harvests during the late 70's and early 80's. These decreasing harvests preceded district closures during the 1984 and 1985 seasons, small post recruit fisheries from 1986 to 1988, and full area closures from 1989 to 1994 (Appendix A).

There are three reasonable explanations for the decline in abundance of the Prince William Sound Tanner crab stock:

1) The overharvest of immature and mature males and the harvest of females prior to the adoption of the minimum size limit of 5.3 inches in 1976. For example in 1974, 3.8 million lb were harvested of which 2.7 million lb were below the current minimum size limit.

2) Lengthy seasons also had significant adverse effects on the stocks due to excessive trapping, handling, and lost gear. Seasons from 1974 through 1981 lasted seven months.

3) Unfavorable environmental conditions: warming ocean temperatures may be a contributing factor to the sharp decline and continued low abundance of Tanner crabs in the management area by favoring the production of predators and providing suboptimal environmental conditions for survival of crab larvae.

1995 Season Summary

The commercial Tanner crab fishery in the PWS management area remained closed in 1995. The 1994 trawl survey indicated a slight decrease in the overall male stock component, however, all size classes except prerecruit-4 and smaller experienced dramatic declines in the newshell segments of the respective classes (Figure 2). For example, estimates of true recruit crabs declined from 54,420 to 4,015, true prerecruit-1 crabs declined from 108,525 to 18,154, and true prerecruit-2 crabs declined from 98,978 to 34,103. The total legal male estimate of 51,204 crabs was approximately one half of the 1993 survey estimate and remained well below the historic low harvest of 226,000 crabs. Therefore, the stock remained in a depressed condition and could not

support sustainable fisheries. The department will continue to use the trawl survey to monitor the stock on an annual basis.

1996 Management Outlook

Based upon the extremely low estimate of true prerecruit-1 crabs assessed in 1994, recruitment to the legal stock component is expected be extremely low in 1995. Skip molting remains a limiting factor in the prerecruit-1 size class where 155,000 (90%) crabs are in an old shell condition. Recruitment is expected to remain at a very low level after 1995. This declining trend is based upon estimates of crabs from true prerecruit-1's down to the true prerecruit-3 level. These classes declined from 303,384 in 1993 to 123,029 in 1994. If weak year classes persist, the stock rebuilding process will be prolonged.

The propagation of weak year classes is a direct function of diminished reproductive capacity. The reduction in the Tanner stock was largely caused by the overharvest of legal, sublegal, and even female crabs during the lengthy seasons of the 1970's. The department plans to maintain maximum reproductive potential to insure recovery when ocean conditions favor shellfish production. In this context the near-term goal is to provide maximum reproductive potential, eliminate handling and trapping losses, and when possible allow small fisheries similar to the 1986 through 1988 seasons.

KING CRAB FISHERY

Introduction

Three species of king crabs are found in the Prince William Sound Management Area: red *Paralithodes camtschaticus*, blue *Paralithodes platypus*, and brown. Red king crabs are sparsely distributed throughout PWS with historic concentrations occurring in eastern PWS and Hinchinbrook Entrance. Blue king crabs occur in the Port Wells - Harriman Fjord area with other small isolated pockets associated with glacial fjords in western PWS. Brown king crabs are found in central and western PWS at depths of 150-400 fathoms. Waters in the Gulf of Alaska portion of the management area have no documented concentrations except for a very sparse distribution of brown king crabs.

The king crab fishery in Area E is designated as superexclusive. The minimum legal carapace width for red and brown king crabs is 7.0 in (178 mm) and for blue king crab 5.9 in (150 m). The regulatory season opens throughout Prince William Sound on October 1 and closes on December 20. A second season opens on January 15 and closes by regulation March 15. The split season allows a three-week period when gear must be removed from the fishing grounds and eliminates the preemption of fishing locations prior to the Tanner crab fishery which opens January 15.

The abundance of red king crabs was ascertained during Tanner crab pot surveys. An annual index was conducted 1977-91 to track the red king crab population. Presently red king crab abundance is assessed through catches in the Tanner crab trawl survey. Brown and blue king crab populations are assessed by commercial fishery dockside interviews and size frequency analysis of commercial catch samples.

Catch reporting by species did not begin until the 1979-80 season (Appendix B). The harvest of nearly 300,000 lb in 1972 is believed to be primarily blue king crab. During the period 1979-

1984 the stocks of both blue and red king crab declined. Fisheries for both species remained closed from the 1984-85 season to the 1991-92 season. These closures coincided with the development of the brown king crab fishery. Fishery performance in the brown king crab fishery indicates that the stock of brown crab is small as evidenced by the low effort coupled with declines in average weight, size, and geographic distribution.

The Alaska Board of Fisheries, at the spring 1988 meeting, adopted a guideline harvest range of 40,000 - 60,000 lb for brown king crab in Area E. This range was adopted to help stabilize the legal segment of the brown king crab stock from declines in average size, weight, and distribution that were experienced since the fishery began in 1982. In the short term this guideline may have been established too late because harvests in 1989-90 and 1991-92 did not attain the low end of this harvest range and the season was closed in 1992-93 and 1993-94 due to low abundance.

1994-95 Season Summary

Only the brown king crab fishery opened during the 1994-95 season. The fisheries for red and blue king crabs remained closed due to low abundance.

Since the department does not survey brown king crab stocks the 1994-95 fishery was informational in nature and designed to put the stock at minimal risk. The brown king crab fishery was delayed from the regulatory opening date of October 1 to November 1 in order to address apparent deadloss due to high water temperature and low salinity. The western portion of PWS was divided into two areas (Figure 3) and fishing opened in each area for a period of 15 days. The southern area, comprising of waters west of 147°20' W. longitude and south of a line from Nellie Juan Light to Point Eleanor, was open November 1-15. The northern area, comprising waters west of 147°20' W longitude and north of the aforementioned line was open November 15-30.

Two vessels participated in the fishery. Catch is confidential due to the low number of participants, however, both catch and catch rates were very low.

1995-96 Management Outlook

Fishery performance data from the 1994-95 season demonstrated that the brown king crab stocks in PWS remained at a very low level. These same data provided no indication of significant impending recruitment to the legal segment of the stock. Reports indicated that the catch of sublegal and female crabs was very low.

The 1991-92 fishery for red and blue king crab likewise provided no indication of impending recruitment. The incidental catch of red king crabs from the department's stock assessment in the eastern portion of PWS also indicated that this stock remained depressed. The 1994 trawl survey captured 2 mature red king crab, one male and one female.

The department does not plan to open the brown king crab fishery for the 1995-96 season. Interviews with participants in the 1994-95 brown king crab fishery indicated that the brown king crab stock in PWS will remain depressed for several years.

The red king crab fishery will remain closed during the 1995-96 season unless the 1995 trawl survey unexpectedly yields substantial king crab catches. The very low number of red king crabs captured in the 1992 and 1993 trawl surveys indicates no change in the depressed status of this stock. Fishery performance data from the 1991-92 fishery also indicated little potential for near term change in this stock's status.

The blue king crab fishery is scheduled to remain closed for the 1995-96 season based on the 1991-92 season fishery performance. Increased recruitment due to immigration is highly unlikely because there is a low probability that this isolated stock is related to other blue king crab populations in Alaska. During the last regulatory season in 1991-92, fishermen reported very few

undersized male and female blue king crabs, therefore, a recovery of the stock is not expected in the near term.

DUNGENESS CRAB FISHERY

Introduction

The Dungeness crab fishery in Area E is classified as "superexclusive". Historically, the major Dungeness crab harvests have come from two areas of Prince William Sound: (1) Orca Inlet District and (2) Copper River District (Figure 4). Dungeness crab were also harvested from the Orca Bay portion of the Northern District and from small populations in western Prince William Sound. However, these harvests have been proportionately small (Appendix C).

Northern District

The Northern District is open year-round. The harvest has been taken either incidental to the Tanner crab fishery or by one or two vessels targeting on Dungeness crab. The district has limited Dungeness crab habitat and a history of low production; for example the recent 10 year average harvest (1984 - 1993) was 684 lb with effort never exceeding 2 vessels. These figures include 7 years when no harvest occurred. The eastern portion of Orca Bay, which adjoins Orca Inlet, provides Dungeness crab to both the Orca Inlet and Northern Districts. Movement generally occurs from Orca Bay into Orca Inlet during the summer with a return to the deeper waters of Orca Bay in the winter.

Orca Inlet District

Orca Inlet, which is immediately adjacent to the community of Cordova, once provided a fishery that allowed participation by small vessels in an area protected from adverse sea conditions. The

largest vessels fishing this area were in the 40-foot seiner class. Most vessels made 1 day trips and delivered each fishing day. Harvests have ranged from over 1.0 million lb in the early 1960's to 35,000 lb in 1976. The limited data available on effort in this district indicate that for the period 1976 to 1979 the number of vessels ranged from 3 to 34 and averaged 23. This district has a 100 pot limit.

The department has conducted an annual survey in the Orca Inlet district since 1977. The District opens September 1 by emergency order only and closes on May 31. This means that the district remains closed by regulation. It has been closed via regulation since 1980. The September opening occurs only if the department survey indicates both an adequate abundance of Dungeness crabs and completion of the annual molt.

The major reason for the continued suppression of the Dungeness crab population in Orca Inlet is predation by the sea otter. The otters arrived in large numbers during 1980 and immediately impacted the Dungeness crab stock. A sea otter predator/prey relationship study conducted in the late 1970's showed that when Dungeness crabs are available, an otter is capable of eating 10 crabs per day.

Copper River District

The Copper River District fishery, which has a 250-pot limit, is a spring and fall fishery due to a regulatory closure for soft shell crabs during the summer months. The recent 10 year (1985 - 1994) average annual catch and effort were approximately 470,000 lb and 10 vessels. These figures include 2.5 years when the season was closed due to low abundance. The Copper River District is not sheltered from the Gulf of Alaska and the longer running distance to market generally requires larger vessels. Beginning in 1987, split regulatory seasons were implemented in the Copper River District with season dates of March 20 to May 20 and July 25 to December 31. The regulatory closure extends from May 20 to July 25 and is designed to protect the stock from handling mortality during the soft shell period following the annual molt. Additionally, the

Controller Bay area closes on October 15. This early closure is designed to reduce gear loss and consequent mortality from storms in this area of shallow water.

The department conducts an annual Dungeness soft shell survey prior to the July 25 opening date. If ten percent or greater of the crabs are in a soft shell condition the fishery is delayed and another survey is conducted in mid-August. The July 25 opening was delayed via emergency order in 1987, 1988, 1990, and 1991 until the crabs had attained an acceptable shell hardness. The corresponding opening dates for the aforementioned years were: August 20, September 15, August 19, and August 28.

The 1992 spring season harvest was 2,458 lb by two vessels. Catch per unit of effort (CPUE) of legal crab averaged 1.0 for both of the department's 1992 soft shell surveys (1.2 in July and 1.1 in August) indicating that the stock was depressed. This condition coupled with relatively poor recruitment resulted in the closure of the 1992 fall season fishery by emergency order.

The 1993 season remained closed due to low abundance. The survey CPUE of legal crab increased to 2.6 during the July survey and 3.5 during the August survey, however, these are comparable to the 1991 survey average which resulted in a season harvest of 70,259 lb. This harvest was approximately 13% of the recent 10 year average of 550,000 lb.

1994 Season Summary

Northern District

No effort occurred in the Northern District in 1994. The district was open for the entire year.

Orca Inlet District

The season was not opened in 1994. The annual survey yielded a total of 8.0 Dungeness crabs in 30 pot lifts. All crabs were captured within a single 5 pot station. Seven male Dungeness crabs ranging in size from 103 to 134 mm and a single softshell female, 106 mm carapace width, were captured. Five of the 7 males were in a softshell condition. These data provide no indication of change in the Orca Inlet Dungeness stock in the near future.

Survey pot bycatch was dominated by yellowfin sole and sea stars. Emergency order closures have been in effect for the subsistence, personal use, and sport fisheries since September 1981.

Copper River District

The Copper River District remained closed during 1994. Department surveys in July and August showed a decrease in the legal stock segment. The August survey CPUE of legal males decreased from 3.5 in 1993 to 1.4 in 1994 (Table 2). The 1994 survey CPUE of legal crabs was comparable to that seen in the department's 1992 survey a year when only 2,458 lb were commercially harvested during the spring season.

1995 Management Outlook

The Northern district will remain open year-round.

Orca Inlet will continue to be surveyed; however, a near term recovery is not anticipated as the sea otter population does not appear to be declining.

The department plans to continue monitoring the summer molt in the Copper River District via the annual survey prior to the July 25 regulatory opening date. If the molting period is prolonged or has not occurred, an emergency order will be issued to delay the fishery opening and the

department will conduct an additional survey in mid-August. The August survey CPUE of true prerecruit-1 crabs showed a decrease from 5.3 in 1993 to 3.1 in 1994 (Table 2) and indicates continued poor recruitment in 1995. The 1995 fishery will remain closed if weak recruitment persists.

POT SHRIMP FISHERY

Introduction

The Prince William Sound pot shrimp fishery targets on spot shrimp and to a limited extent coonstripe shrimp *Pandalus hypsinotus*. Commercial landings were first documented in 1960 when 4,100 lb were harvested. From 1960 until 1977, catch varied from no reported harvest in 1962 and 1966 to a high of 20,000 lb in 1974 (Appendix D.)

The pot shrimp fishery expanded rapidly after 1978 with increases in both catch and effort. Growth of the fishery was greatest from 1978 through 1982. During this period local markets were established and the major harvest areas located. Landings increased from 12,000 lb in 1978 to 178,000 lb in 1982. Similarly, effort increased from 9 to 57 vessels during this period. Harvests were stable from 1982 through 1984 due to a management strategy which employed the following:

1) Elimination of year-round fishing, and seasons set to avoid fishing during peak egg bearing periods.

2) Establishment of a guideline harvest range based upon historical harvests.

In September of 1984 the Alaska Board of Fisheries (BOF) adopted a spot shrimp management plan. The plan established three fishing areas: the Traditional Harvest Area (THA), Montague Strait Experimental Harvest Area (MSEHA), and the Eastern Harvest Area.

In 1990, the BOF eliminated the MSEHA and incorporated these waters into the Traditional Harvest Area. The MSEHA was originally established as an experiment to determine if continuous fishing would depress the shrimp stock. Subsequently, due to continuous fishing from 1985 - 1988, a stock conservation problem developed in the MSEHA. Catches declined in the MSEHA from approximately 46,500 lb in 1986 to 2,000 lb in 1988. The department closed this area in October 1988.

The majority of pot shrimp were caught in the northern and western portions of Prince William Sound (Traditional Harvest Area) which are characterized by numerous steeply cut glacial fjords and passages. This area encompasses the northern shore from Port Valdez to Whittier and all of western and southwestern PWS including Montague Strait (Figure 5). Market access is through the ports of Whittier, Valdez and Seward, which have direct transportation ties with the Anchorage metropolitan area. This accessibility has been the key to development of fresh markets for unprocessed spot shrimp because the product can be utilized shortly after capture. The Prince William Sound pot shrimp fishery is unique in that participants vary from full-time to seasonal and weekend fishermen. This heterogeneous mix has split the industry as to the desired season of harvest.

Two regulatory fishing seasons occur per calendar year in the Traditional Area. The spring season opening date was changed during the spring 1990 BOF meeting. The spring season now opens on May 1 rather than March 15. The justification for delaying the season opening was a desire to avoid harvest during the egg release period. The spring season closes on June 30. The fall season begins on August 15 and continues until December 15. During the spring 1994 BOF meeting the annual guideline harvest range was reduced from 150,000 - 200,000 lb to 0 - 100,000 lb. The guideline is split evenly between the two seasons. Either season may be closed earlier by emergency order if the harvest level is achieved. When excessive harvest occurs during the spring season the poundage is deducted from the fall season.

The Board of Fisheries adopted two new gear related proposals during the March 1990 Board meeting. The first regulation placed a limit of 150 pots per vessel. The second regulation was

intended to provide protection to small, nonsalable size shrimp by requiring rigid 7/8" mesh which would allow these shrimp to escape. Pots with a definable side must have at least two adjacent sides completely composed of the rigid mesh. Round pots must have rigid mesh covering a minimum of 50% of the vertical surface area of the pot.

The Eastern District has a very low production history and is designated as a year-round fishery. Harvests in this District have averaged less than 1,000 lb. Due to low effort, catches are held confidential. A Commissioner's permit is required for this area to allow the monitoring of effort and catch via mandatory logbooks and department contact.

In 1989 the department began a survey of spot shrimp in the THA to assess the spot shrimp stocks. Six stations in the northern, western, and southwestern portions of PWS have been surveyed annually since 1989. Two experimental stations in the southwestern Sound were added in 1991. Data from the survey, specifically CPUE and sex ratios, were used in making management decisions regarding the fishery.

The total annual harvest from Prince William Sound declined rapidly from 290,632 lb in 1986 to 29,315 lb in 1989. In 1990 the catch was 36,737 lb. The fishery was closed by emergency order due to low abundance. Although the subsequent survey continued to indicate a depressed stock, the department wanted to further validate the survey data via a limited commercial fishery. The 1991 fall spot shrimp fishery in the Traditional Harvest Area provided this opportunity.

The fishery opened September 10 by emergency order. A reduced preseason guideline harvest range (GHR) of 10,000 to 40,000 lb whole shrimp weight was set by the department. The reduction was in response to fishery performance as well as the department's 1990 survey data which indicated that the stock was depressed and the number of spawning females low. The survey, however, also showed a moderate year class of males which had the potential to recruit into the fishery in 1991.

The 1991 commercial harvest of pot shrimp in the THA of the Prince William Sound Management Area was 17,255 lb (whole shrimp weight) taken by 14 vessels making 44 landings. The harvest by species was 16,977 lb of spot shrimp and 278 lb of coonstripe shrimp. The 1991 Eastern District harvest was 325 lb of spot shrimp taken by 1 boat.

The department initiated a voluntary logbook program to aid in data collection during the 1991 fishery. Participation was high at 65%. Logbook and fish ticket data showed that the harvest was indicative of stock condition because fishing effort was distributed throughout the THA. These data also indicated no improvement in CPUE since the spring 1990 fishery. Furthermore, the overall CPUE from the 1991 fishery and the department's fall 1990 survey were comparable at 0.8 and 0.9 lb of whole shrimp per pot (Table 3). The fishery closed by emergency order on October 25, 1991.

The commercial spot shrimp season remained closed in the THA through 1993 due to low abundance. Fishery performance data from the 1991 fishery indicated that the stock was in a depressed condition. These data were also supported by the department's spot shrimp surveys from 1991 and 1992 in which average CPUE declined from 1.3 to 0.8 lb of whole shrimp per pot.

1994 Season Summary

The Eastern district remained open to harvest through 1994, however, there was no effort.

Commercial fishing in the THA was closed in 1994 due to continued low abundance. The October spot shrimp survey showed a decline in CPUE of adult spot shrimp from 0.8 lb in 1992 to 0.4 lb in 1993 (whole shrimp per pot). Survey catches of spot shrimp at experimental stations in southwestern PWS declined as well with CPUE dropping from 0.6 lb in 1992 to 0.2 in 1993 (Table 4).

1995 Management Outlook

Traditional Harvest Area

The 1994 annual spot shrimp survey within the THA indicated that although the stock remained depressed it had not exhibited further decline from previous surveys. Catch per pot at the traditional stations of the 1994 survey was identical to the 1993 survey and averaged 0.4 lb of whole shrimp per pot (Table 3). Based upon these data, the department intends to close the fishery through 1995.

It is apparent that a conservative management approach is warranted for the following reasons:

1) The number of female and large male shrimp is low. If a fishery is permitted, these shrimp will be targeted as salable and the abundance of this size range will decline further thereby reducing the brood stock and increasing the risk of future recruitment failure.

2) Spot shrimp are long lived and slow growing further emphasizing the need to keep fishing mortalities low.

The October 1995 spot shrimp survey will occur after the period of summer growth. This survey will provide the basis for a management decision regarding the 1996 fishery.

Eastern Prince William Sound

The department plans to allow year-round fishing in this area during 1995. Production remains low and it appears that no significant quantities of spot shrimp exist. All shrimp harvests in this district have occurred within PWS. The Gulf of Alaska portion of this area does not provide the habitat required for spot shrimp.

TRAWL SHRIMP FISHERY

Introduction

Emphasis in the trawl shrimp fishery has shifted from the harvest of pink shrimp *Pandalus borealis* in southwestern Prince William Sound to sidestripe shrimp in northwestern PWS (Figure 6). Large Kodiak based vessels harvested pink shrimp in southwestern PWS and constituted the main effort during the early 1980's. The fishery for pink shrimp declined due to the low ex-vessel value of pink shrimp, limited processing capabilities, and declining pink shrimp stock conditions (Appendix E). After the trawl fishery for pink shrimp was fully developed, catches ranged from 171,000 lb to 1.3 million lb and effort ranged from 3 to 14 vessels.

The first documented harvests of sidestripe shrimp occurred in 1983 around the Icy Bay area, however, recent activity has focused on northwestern PWS. Increased harvests of sidestripe shrimp began in 1985. The reason for the sudden expansion was the development of markets and gear by fishermen with small vessels, targeting on stocks which were previously unfished. Sidestripe tails are sold fresh in Anchorage while markets for whole, fresh, and frozen sidestripes existed in both Anchorage and Japan. Since sidestripe shrimp became the predominant species of harvest in 1987, catch and effort have expanded from 96,000 lb to 246,000 lb and 2 to 7 vessels respectively. The incidental harvest of pink shrimp during this same period ranged from 275 to 3,500 lb.

At the spring 1986 shellfish meeting the Board of Fisheries (BOF) established a commercial fishing season of March 1 through November 30 for sidestripe shrimp fishing in northwestern PWS. Subsequently in 1990 the Board adopted a split season of April 1 through August 15 and September 15 through December 31 for the northwestern area and retained a January 1 through December 31 season for the central and southwestern Sound. The northwestern PWS opening date was delayed to allow for completion of the egg release. The closure from August 16 through September 14 was proposed by a fishermen who indicated to the Board that soft-shell

shrimp were prevalent in the catch during that time. The season was extended to December 31 to enable fishermen to provide shrimp for holiday markets.

At the spring 1994 shellfish meeting the BOF created the Northwest Shrimp Trawl Fishing District (NSTFD) and set season dates of April 15 to August 15, and October 1 to December 31 for the entire management area. The spring season date change was based upon data which indicated that egg release was not complete until April 15. The fall season date was changed based upon the recommendation of fishermen indicating that soft shell shrimp were present until at October 1. Additionally, the BOF changed the cod end requirement and stipulated that the entire cod end be composed of square hung $1^{7}/_{8}$ in mesh. Other changes made in the regulatory framework of the shrimp trawl fishery included the deletion of the Icy Bay Shrimp District and it's GHR.

Concern for the conservation of the sidestripe shrimp resource in Port Wells heightened as catch and effort increased. In April 1990 the department initiated a program utilizing onboard observer data to calculate an area-swept estimate of shrimp abundance for the Port Wells area. A 20% harvest rate was applied to the estimate. In 1990, 1991, 1992, and 1993 this method yielded harvest levels of 65,000, 80,000, 65,000, and 46,000 lb, respectively. For the period 1990 through 1993, fishery closures were effected by emergency order in the Port Wells area on August 15, June 23, June 3, and May 20 due to attainment of the respective harvest levels.

In summary the current regulatory measures for trawl shrimp are:

1) April 15 - August 15 and October 1 - December 31 season dates.

2) Cod end mesh requirement. Cod ends must be completely composed of 1 7/8 inch stretched mesh hung horizontal and perpendicular to the mouth of the trawl.

3) A year-round closure in eastern Prince William Sound (Port Fidalgo, Orca Bay and Hinchinbrook Entrance, north Montague) to minimize indirect fishing mortality on king and Tanner crab stocks in these key production areas.

1994 Season Summary

The sidestripe shrimp season in northwestern PWS opened by regulation on April 15, 1994. The department continued to collect onboard observer data in 1994 during the commercial fishery in Port Wells. A biomass estimate, using area-swept data collected from a commercial vessel, was established for *Pandalid* shrimp in the Port Wells area. A 20% harvest rate was applied to this estimate yielding a 35,000 lb quota. This was the fourth consecutive year that the biomass estimate indicated a decline in the stock. The Port Wells and Wells Passage portion of the NSTFD closed by emergency order on May 24, 1994 when the quota was achieved.

After the closure of the Port Wells area, the trawl fishery for sidestripe shrimp shifted into the remainder of the management area, primarily Perry Passage and the central portion of PWS. Catches and catch rates in these areas have declined over the previous 3 years. In response to the trend of declining catch and cpue fishery wide, as well as a BOF directive for a conservative approach to management of the sidestripe fishery, the department closed all inside waters of PWS on July 6, 1994. At the time of the closure, the department stated it's intention to reopen the central and southwest portions of PWS to fishing on October 1 in order to monitor possible seasonal changes in abundance and distribution.

The department reopened the trawl shrimp fishery in the central and southwest portions of PWS October 1, 1994 with a conservative ghl of 10,000 lb. Participation was low with a single vessel reporting catch. There was little change in catch rates therefore the ghl was not raised. The fishery closed on October 20, 1994. Actual catch data are confidential due to the low number of participants.

The gulf waters of the PWS management area remained open through the regulatory season, however, the small amount of effort expended in this area did not indicate any significant concentration of sidestripe shrimp.

The 1994 PWS sidestripe shrimp fishery harvest totalled 110,863 lb of *Pandalid* shrimp taken by six vessels during the 1994 season. The harvest was composed of 86,729 lb of marketable sidestripe shrimp, 749 lb of pink shrimp, and 24,134 lb of deadloss. Deadloss is composed of unmarketable or small undersized sidestripe and pink shrimp. Deadloss typically accounts for 5% to 45% of the shrimp catch depending upon the vessel and its markets. The reporting of deadloss remains incomplete. Some vessels report no deadloss and others only a small proportion of the actual amount.

Five of the six vessels participating in the fishery operated otter trawls; the other was a beam trawl. Vessel length ranged from 32' to 90'. The average ex-vessel value for trawl-caught shrimp was $2.04 per lb whole shrimp weight giving a fishery value of approximately $226,000.

1995 Management Outlook

The department will continue to manage the sidestripe trawl fishery in the Port Wells area via a 20% harvest rate applied to an area-swept population estimate generated from commercial trawl vessel data. Fishery performance data indicate that the sidestripe stock in the Port Wells portion of the NSTFD has declined from earlier years. Catch per hour towed declined by approximately 50% from 1991 to 1992. Catch rates in 1993 declined slightly from 1992 levels and in 1994 catch rates dropped again. As a result there is a strong likelihood of a reduced harvest level in 1995. Effort in the fishery is expected to continue to increase resulting in the early attainment of the guideline harvest level and prompting an early closure similar to the past two seasons. As seen in 1993, an early closure of the Port Wells area will likely disperse effort and result in increased pressure on recently developed harvest areas and possibly, development of new harvest areas.

The central portion of PWS, which accounted for approximately 60% of the 1993 harvest, contributed less than 30,000 lb to the 1994 harvest. This area has produced between 100,000 and

150,000 lb annually over the past two years. The 1995 preseason guideline harvest level for this area will be set equal to the 1994 harvest. The department plans to continue monitoring the catch from this area for significant changes in CPUE via logbooks. A harvest level may eventually be established using a survey methodology similar to that used in the Port Wells area.

Due to very limited processing capability and limited abundance, no fishery targeting on pink shrimp is expected in southwestern PWS in 1995.

RAZOR CLAM FISHERY

Introduction

Beginning in 1916 and continuing into the mid 1950's, Cordova was known as the "razor clam capital of the world". Although historical fishery statistics are imprecise, it appears that the majority of razor clams were harvested from Orca Inlet and the western Copper River Delta (Figure 7). The eastern Copper River Delta, which includes Kanak Island, was not a substantial contributor to the early harvests. Catches during this time ranged from 3.6 million lb in 1917 to a frequent harvest of over 1.0 million lb. Most of the product was canned and used for human consumption.

The razor clam industry began to decline in the 1950's for a number of reasons:

1) Economic: the east coast clam fishery gained economic dominance.
2) Biological: substrate change caused largely by alteration in the Copper River outflow that severely affected juvenile survival.

The "Good Friday Earthquake" in 1964 caused significant uplift in prime razor clam habitat in Orca Inlet. Loss of habitat resulted in record low harvests in the 70's and early 80's (Appendix

F). The majority of the production since the mid-70's has come from the eastern Copper River Delta which includes Kanak Island.

In the late 50's and early 60's, commercial demand for razor clams shifted from human consumption to Dungeness crab bait. The demand for razor clams for human consumption increased again in 1983 when a decline in clam abundance in Washington state led to an expanded fishery in Prince William Sound. Since 1983 the majority of the clam harvest has been taken at Kanak Island beach with minor amounts coming from Softuk and Katalla beaches on the eastern Delta. Yearly harvests during the 1980's attained a maximum of 170,000 lb in 1984 with a recent ten year (1981 - 1990) average annual harvest of 45,000 lb and an average of 16 diggers.

The department monitors commercial razor clam harvests via fish ticket information. The non-commercial harvest is monitored through a permit system which requires a harvest report. The minimum legal size of clams is 4.5 in (114 mm) in length.

A guideline harvest range of 100,000 to 150,000 lb is in effect for the combined commercial and sport/subsistence harvests from Kanak Island. By regulation, clams harvested from Kanak Island must be used for human consumption as food. Kanak beach receives annual certification by the Alaska Department of Environmental Conservation (ADEC). Certification allows bivalves to be sold for human consumption.

Although Kanak Island is designated for human consumption, the department has difficulty enforcing this regulation. Sand bars near Kanak, that are exposed at low or minus tides, have been the source of bait clams. For enforcement purposes, the department has defined Kanak Island as all tidelands that have a physical land connection with Kanak Island during any tide stage.

1994 Season Summary

There was no commercial harvest of razor clams from the PWS management area in 1994.

The reported non-commercial harvest (subsistence, sport, and personal use) during 1994 was 459 lb. The department issued 61 non-commercial permits for the Copper River Delta of which 28 dug clams, 31 did not dig, and 2 did not report. Harvest was greatest from Kanak Island beach with 223 lb reported. Katalla beach and the Softuk bar area accounted for the balance of the harvest with 151 and 85 lb reported.

1995 Management Outlook

Although the department does not conduct population estimates, reports from non-commercial diggers indicate that razor clam abundance has declined over the previous five years on the eastern delta. This information is supported by the lack of interest from commercial diggers. Additionally, ex-vessel value of razor clams has not substantially increased for several years. Bait and food clams command a similar price per pound. The local bait clam market has been poor since 1991 due to the depressed Dungeness stocks on the Copper River Delta. Unless an increased demand for food clams occurs and clam abundance increases over current levels, the harvest will remain well below the guideline harvest range of 100,000 to 150,000 lb set for the beach at Kanak Island. If effort increases at Kanak Island, the department will monitor the stock via catch per unit of effort data.

WEATHERVANE SCALLOP FISHERY

Introduction

A fishery for weathervane scallops developed in the PWS management area in 1992. Although landings have occurred from the Yakutat area to the east since the late 1960's, the 1992 harvest constitutes the first documented commercial scallop landings from Area E.

The 1992 harvest of weathervane scallops in the PWS management area totalled 208,836 lb of meats taken by 4 boats. This poundage equates to approximately 2.1 million lb whole scallop weight. The commissioner's permit was a management tool used to require fishermen to submit logbooks and weekly catch reports. Harvest occurred from two statistical areas (202-09 and 202-10) in the Kayak Island vicinity (Figure 8). Waters of PWS and nearshore Gulf waters remained closed to scallop dredging due to department bycatch concerns for depressed Tanner and Dungeness crab stocks.

Fishing began in late February and closed by emergency order on April 23. The closure was based upon an allowable harvest of 64,000 lb meat weight which was established by developing an area-swept scallop biomass estimate using fishery performance data and applying a 10% harvest rate. This harvest rate is identical to that specified by the Board of Fisheries for the Cook Inlet scallop fishery.

Vessel length ranged from 74' to 147' and each towed two 15' New Bedford style dredges. Participants delivered both fresh and frozen product. The average price was $3.98 per lb making the fishery worth approximately $831,000.

The discrepancy between allowable (64,000 lbs) and actual harvest (208,836 lbs) is directly attributable to a lack of timely and accurate catch reporting. As the fishery progressed, both effort and the geographic area fished increased. Information gathering was difficult because the

majority of landings occurred at a port with no department staffing. Collection of data inseason was accomplished by weekly radio reports of estimated catch, however, actual catch by each vessel was not ascertained until the time of landing. Errors in radio reports of estimated catch were not evident in some cases for up to 2 weeks. The time delay was attributable to fishing trip length and the time necessary for a fish ticket to arrive via mail. By the time that a picture of scallop stock distribution and density had emerged, the harvest had progressed to an estimated 150,000 lb. When the fishery closed three days later the harvest was approximately 209,000 lb meat weight.

After the eastern Gulf portion of the management area closed, participants expressed an interest in exploratory fishing in the western Gulf portion of the area. Effort in the western Gulf portion of the management area was low with only two participants and no reported harvest.

During 1992, in response to the increases in scallop harvests statewide, the department initiated development of an interim fisheries management plan under 5 AAC 39.210. Management Plan for High Impact and Emerging Fisheries. This interim management plan was formulated and implemented prior to the July opening date in PWS.

Key features of the PWS portion of the plan included:

1. Area registration.
2. Gear requirements including 4" ring size and maximum of two 15' dredges.
3. Guideline harvest level of 50,000 lb meat weight.
4. Bycatch caps of 500 and 130 Tanner crabs east and west of 147°00' W. longitude, respectively.
5. Season dates set by emergency order.
6. Industry-funded Observer Program.
7. Crew size limit of 12.

Two fishing areas were established (Figure 9):

1. Eastern Area - waters east of 147°00' W. longitude and south of 60°00' N. latitude.

2. Western Area - waters west of 147°00' W. longitude and south of 59°45' N. latitude.

The Eastern area comprised the area of primary harvest with a quota of 50,000 lb meat weight. The Western area opened to provide an opportunity for exploratory fishing with an initial quota of 5,000 lb.

The 1993 scallop fishery in the PWS management area opened on July 15 at 12:00 noon. Prior to fishing each vessel was required to register and each observer was briefed. Radio contacts were made twice daily with each observer reporting fishing area, number of tows, sampling intensity, crab bycatch, and scallop catch.

Seven vessels ranging in length from 81' to 145' participated in the fishery. The scallop harvest from the Eastern area totalled 63,068 lb meat weight. Catch per tow and tow length averaged 231 lb meat weight and 51 minutes. The fishery closed in the eastern area by emergency order on July 18, 1993 at 7:00 a.m. resulting in a fishery duration of 67 hours (2.8 days).

Four vessels made tows in the western Gulf area after the Eastern area closed. No catch was reported from this area.

The Statewide Scallop Management Plan was adopted with changes during the spring 1994 BOF meeting. The season opening date was set at January 10 with the closure set by emergency order. Additionally the 1994 Plan established closed waters in the eastern portion of PWS and waters along the Copper River Delta. These closures were intended to address concerns for depressed Tanner crab stocks in PWS and the depressed Dungeness crab stocks in the Copper River Delta area.

1994 Season Summary

There was no commercial scallop season during 1994 due to the change of season dates from a July to a January opening. Any harvest in 1994 would have effectively doubled the removals from the stock during the same spawning cycle. Therefore, the department set the next opening for January 10, 1995.

1995 Management Outlook

Fishing in 1992 and 1993 indicated that the PWS area scallop stock is confined to 2 relatively small areas. Experimental fishing in both 1992 and 1993 the western Gulf of Alaska portion of the management area yielded no indication of a commercial scallop resource. The harvest level for the PWS management area will be 50,000 lb meat weight. Effort for scallops appears to be increasing statewide; therefore, it is reasonable to expect the PWS fishery to experience a similar increase. Given the current allowable harvest level, any increase in effort will likely result in a fishery of very short duration.

MISCELLANEOUS SHELLFISH

Squid and Octopus

Squid are taken as bycatch during the commercial shrimp trawl fishery. The 1994 harvest totalled 2,523 lb by 3 vessels. Octopus harvested incidentally to the longline and pot groundfish fisheries totalled 4,500 lb. These were the only reported landings of octopus.

Sea Cucumbers and Urchins

There have never been any reported landings of sea cucumbers or urchins from the PWS management area. The department conducts no surveys of either sea cucumbers or urchins. The most recent effort for sea cucumbers occurred in 1992 when five permits were issued, however, no catch was reported. This is consistent with anecdotal reports on abundance from both department and sport divers.

No permits have been issued for sea urchin harvest. Anecdotal information indicates few urchins of a marketable size in PWS.

Table 1. Shellfish Emergency Orders, Prince William Sound Management Area, 1994-95.

Fishery	Emergency Order #	Effective Date	Explanation
Tanner	2-S-E-01-95	01/15/95	Commercial - Closed the entire management area to Tanner crab fishing due to low stock abundance.
	2-S-E-03-95	02/01/95	Personal Use - Closed northern Montague Hinchinbrook entrance and Orca Bay due to low stock abundance.
	2-S-E-04-95	02/01/95	Subsistence - Closed northern Montague Hinchinbrook entrance and Orca Bay due to low stock abundance.
King	2-S-E-12-94	10/01/94	Commercial - Closed red and blue king crab due to to low abundance. Delayed brown king crab until November 1.
	2-S-E-11-93	10/01/93	Personal Use - Closed northern Montague, Hinchinbrook Entrance, and Orca Bay to subsistence king crab fishing due to low stock abundance.
	2-S-E-12-93	10/01/93	Subsistence - Closed northern Montague, Hinchinbrook Entrance, and Orca Bay to subsistence king crab fishing due to low stock abundance.
Dungeness	2-S-E-10-94	07/25/94	Commercial - Closed Copper River District fishery until July 25, 1995 due to low abundance.
	2-S-E-04-94	01/11/94	Personal Use - Closed Orca Inlet to fishing due to low abundance.
	2-S-S-05-94	01/11/94	Subsistence - Closed Orca Inlet to fishing due to low abundance.
Pot Shrimp	2-S-E-07-94	05/01/94	Commercial - Closed the western side of Prince William Sound (formerly Traditional Harvest Area) to fishing for the 1994 season.
Trawl Shrimp	2-S-E-06-94	03/23/94	Commercial - Established newly adopted season dates.
	2-S-E-08-94	05/24/94	Commercial - Closed the Port Wells area due to attainment of guideline harvest level.
	2-S-E-09-94	07/08/94	Commercial - Closed inside waters of PWS management area to trawling for shrimp.
	2-S-E-11-94	10/01/94	Commercial - Opened all of PWS management area except the Northwest District to trawling for shrimp.
	2-S-E-13-94	10/20/94	Commercial - Closed entire PWS management area to trawling for shrimp.

Table 2. Copper River District Dungeness crab survey average catch per pot of legal, sublegal and female crabs, July 1985 - 1994.

Year	Number of Pots	Legal Crabs	True Recruits		Sublegal Crabs	Newshell Sublegal		Female Crabs
1985	65	9.4	8.3	(88%)	5.4	3.3	(61%)	0.0
1986	80	9.1	7.3	(80%)	9.7	2.2	(23%)	5.3
1987	80	9.7	5.6	(58%)	10.5	4.4	(42%)	9.8
1988	80	10.7	7.4	(69%)	12.1	3.7	(31%)	12.0
1989	80	12.1	1.0	(8%)	5.4	0.4	(7%)	6.8
1990	80	7.7	2.6	(34%)	9.8	2.0	(20%)	8.5
1991	80	2.6	1.4	(54%)	9.6	1.9	(20%)	12.8
1992	80	1.2	0.6	(50%)	10.9	3.2	(29%)	1.1
1993	80	2.6	1.3	(50%)	13.3	5.3	(40%)	0.6
1994	80	1.3	0.4	(29%)	8.6	2.6	(26%)	1.1

Table 3. Traditional station catch statistics from the PWS spot shrimp surveys, 1989 - 1994.

Year	1989	1990	1991	1992	1993	1994
Number of pots	132	197	194	261	250	264
Number of pounds	170	176.8	259.8	202.1	104.7	89
Mean weight per pot (lb)	1.3	0.9	1.3	0.8	0.4	0.3
Number of shrimp	5192	4283	5964	3962	2075	2541
Mean # shrimp per pot	39	22	31	15	8.3	9.6
Number of males	4958 (96%)	3910 (91%)	5535 (93%)	3480 (88%)	1654 (80%)	2418.0 (95%)
Number of females	234 (4%)	373 (9%)	429 (7%)	482 (12%)	421 (20%)	123 (5%)
Number of ovigerous female	213	343	324	463	413	118
Mean size males (mm)	27.7	29.3	30.5	31.7	28.1	27.5
Mean size females (mm)	41.3	41.9	41.3	41.9	42.5	43.5

Table 4. Experimental station catch statistics from the PWS spot shrimp surveys, 1991 - 1994.

Year	1991	1992	1993	1994
Number of pots	11	110	86	87
Number of pounds	0.8	70.4	19	43.5
Mean weight per pot (lb)	<0.1	0.6	0.2	0.5
Number of shrimp	25	1233	432	1274
Mean # shrimp per pot	2	11	5	15
Number of males	24 (96%)	1085 (88%)	371 (86%)	1233 (97%)
Number of females	1 (4%)	148 (12%)	61 (14%)	41 (3%)
Number of ovigerous female	1	147	58	41
Mean size males (mm)	31.4	33.0	27.5	27.6
Mean size females (mm)	40.4	43.0	43.3	43.8

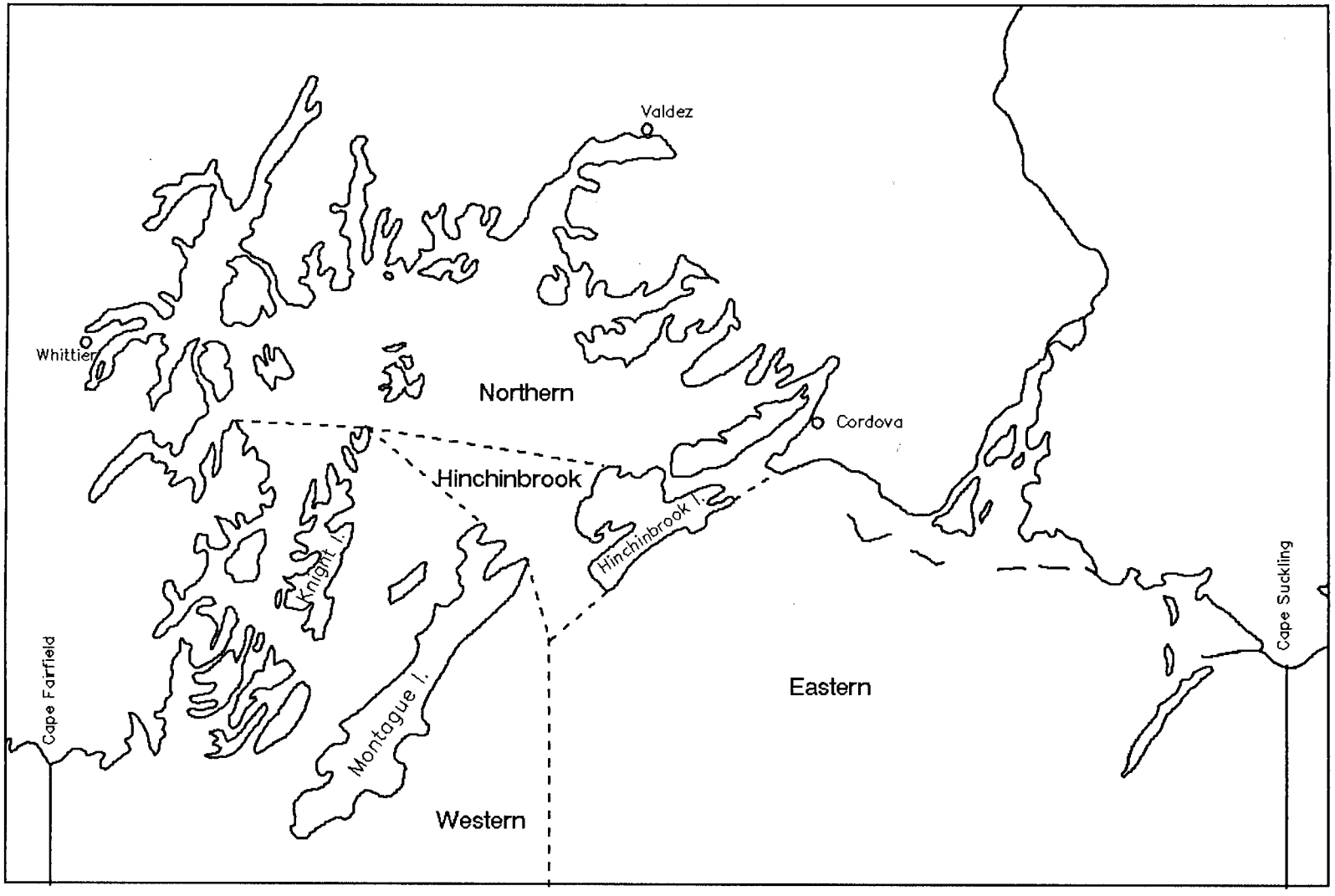

Figure 1. Prince William Sound Tanner Crab Fishing Districts.

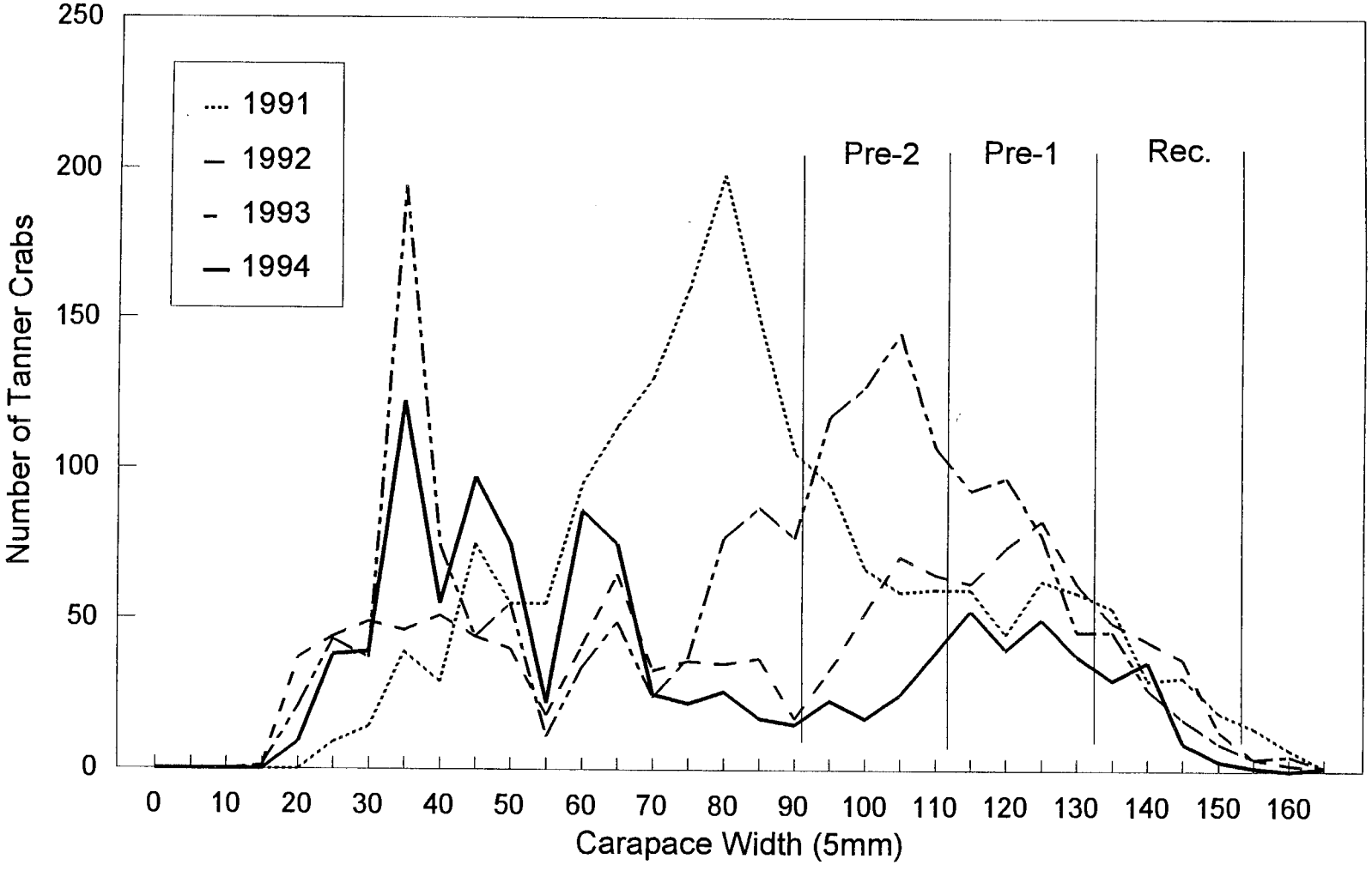

Figure 2. Male Tanner crab size frequencies from the Northern and Hinchinbrook Districts, 1991 - 1994 PWS trawl surveys.

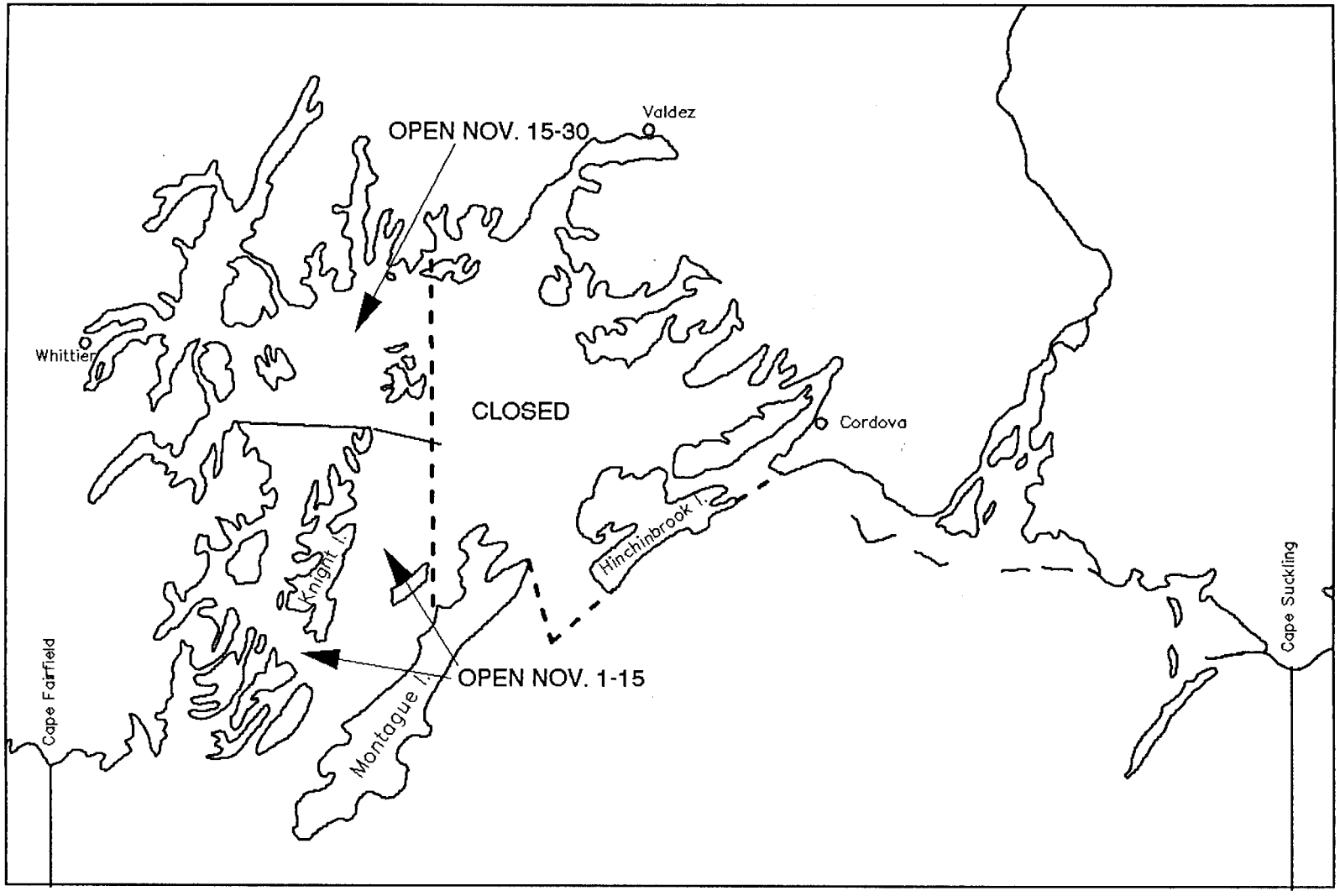

Figure 3. Prince William Sound 1994 brown king crab fishing areas and seasons.

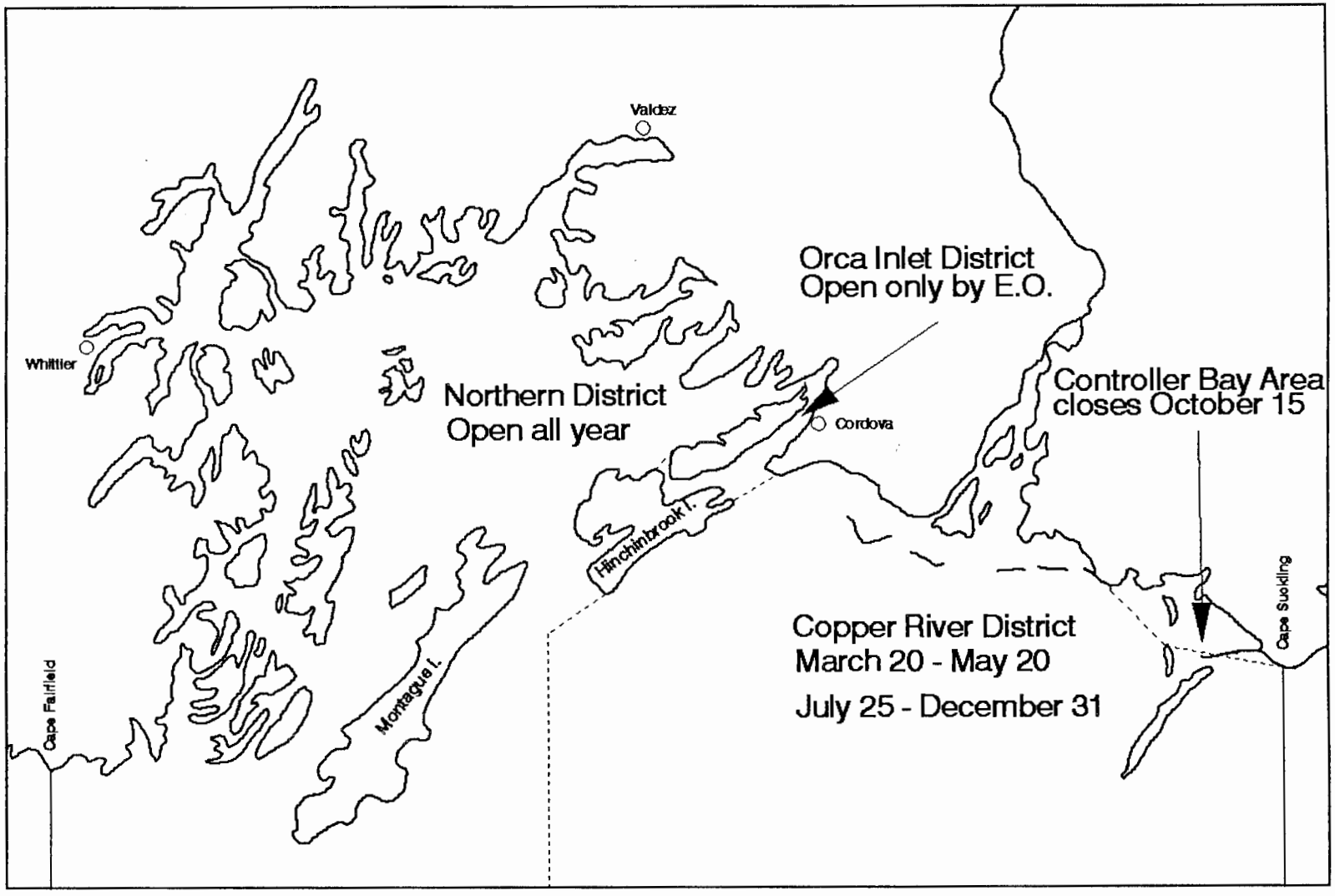

Figure 4. Prince William Sound Dungeness fishing seasons and districts.

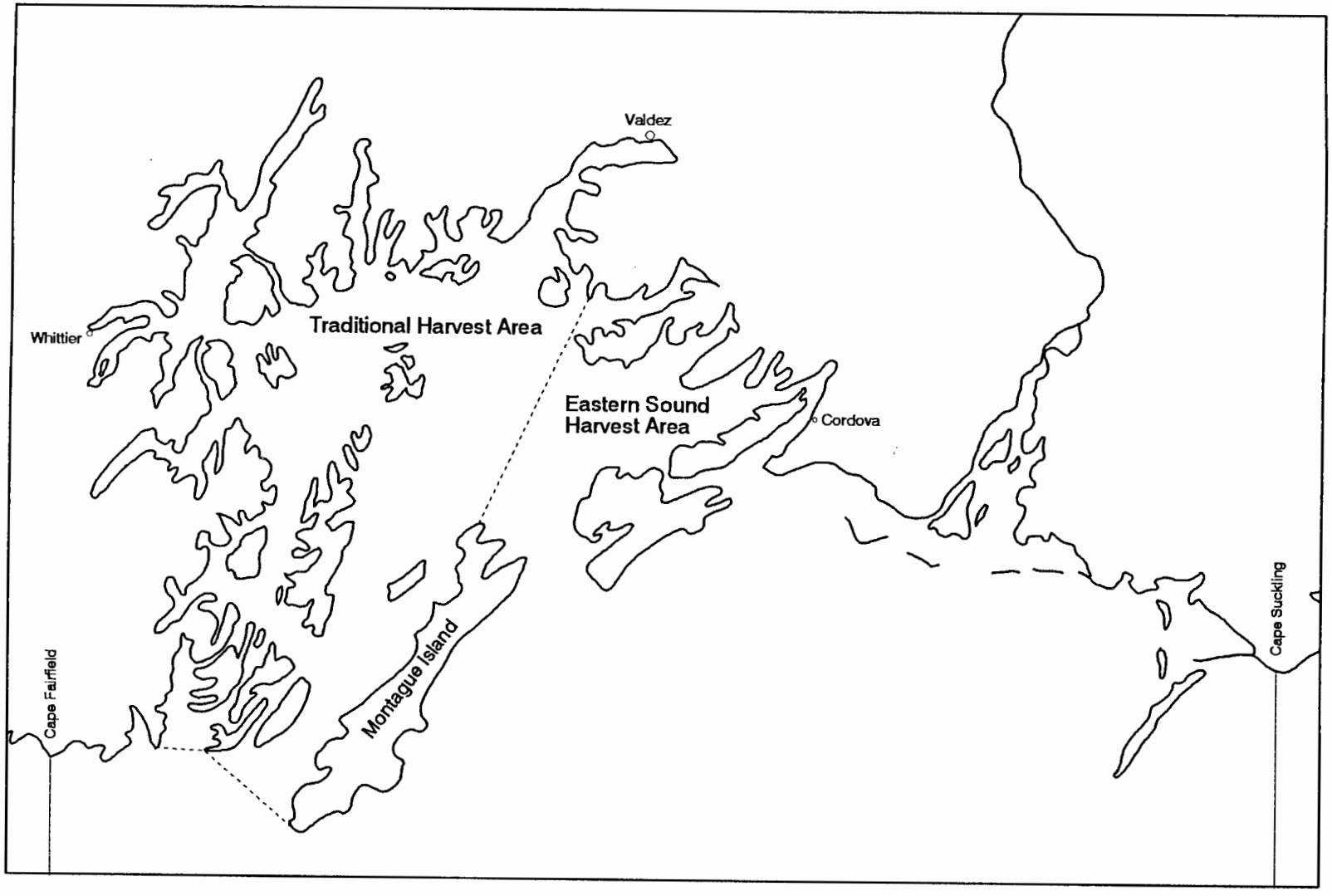

Figure 5. Prince William Sound pot shrimp management areas.

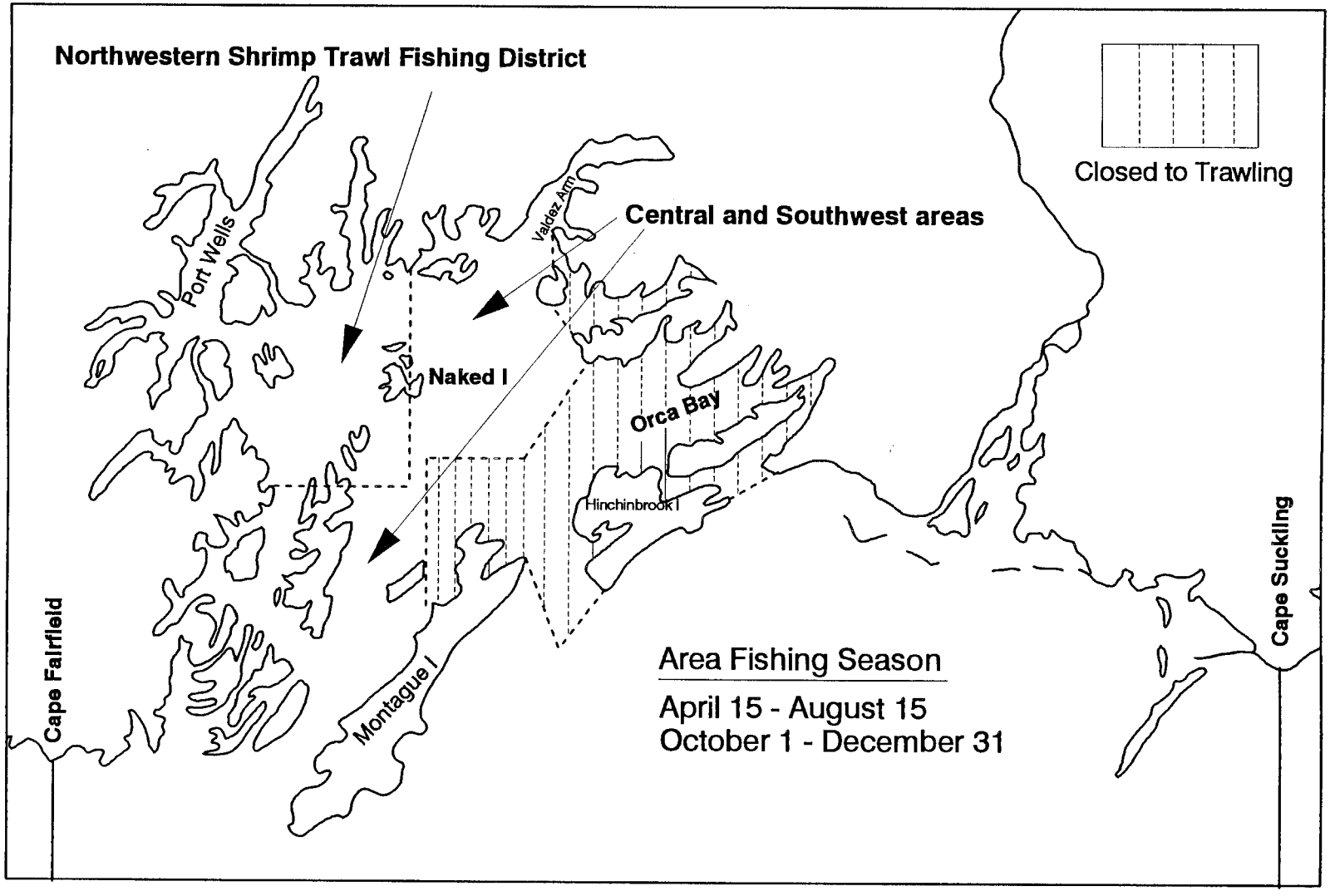

Figure 6. Prince William Sound 1994 trawl shrimp fishing areas and seasons.

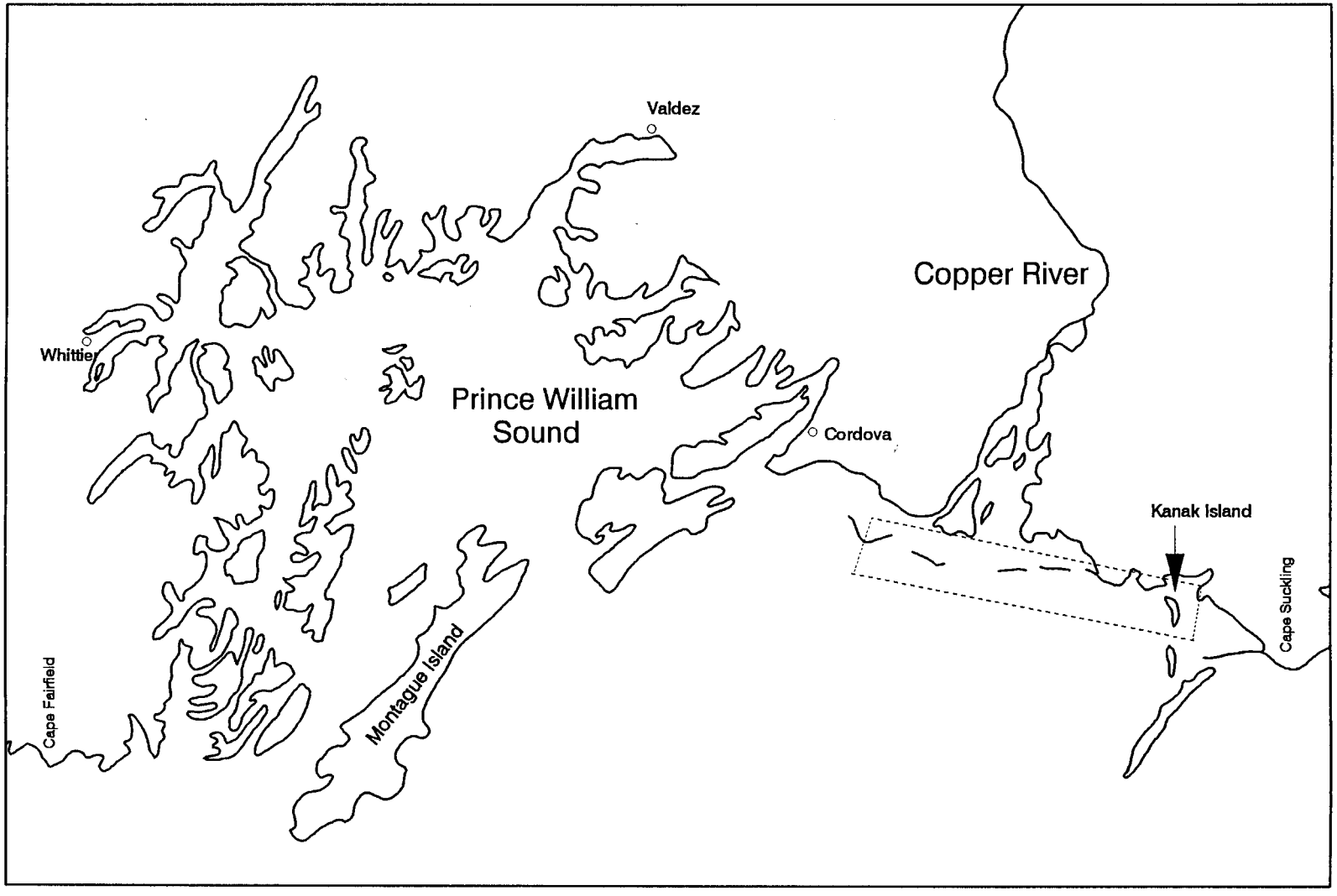

Figure 7. Copper River Delta razor clam harvest area.

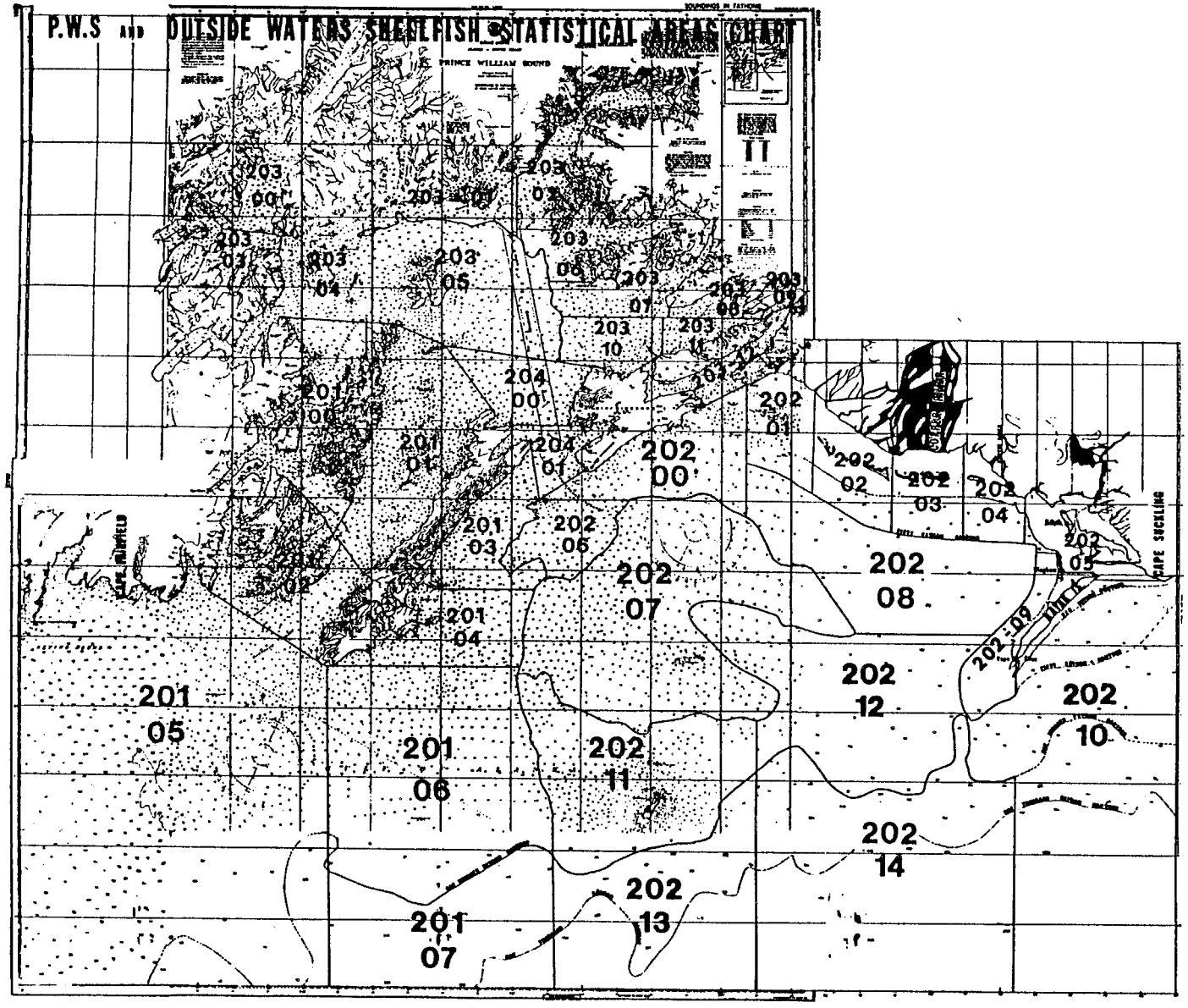

Figure 8. Prince William Sound and outside waters shellfish statistical areas chart.

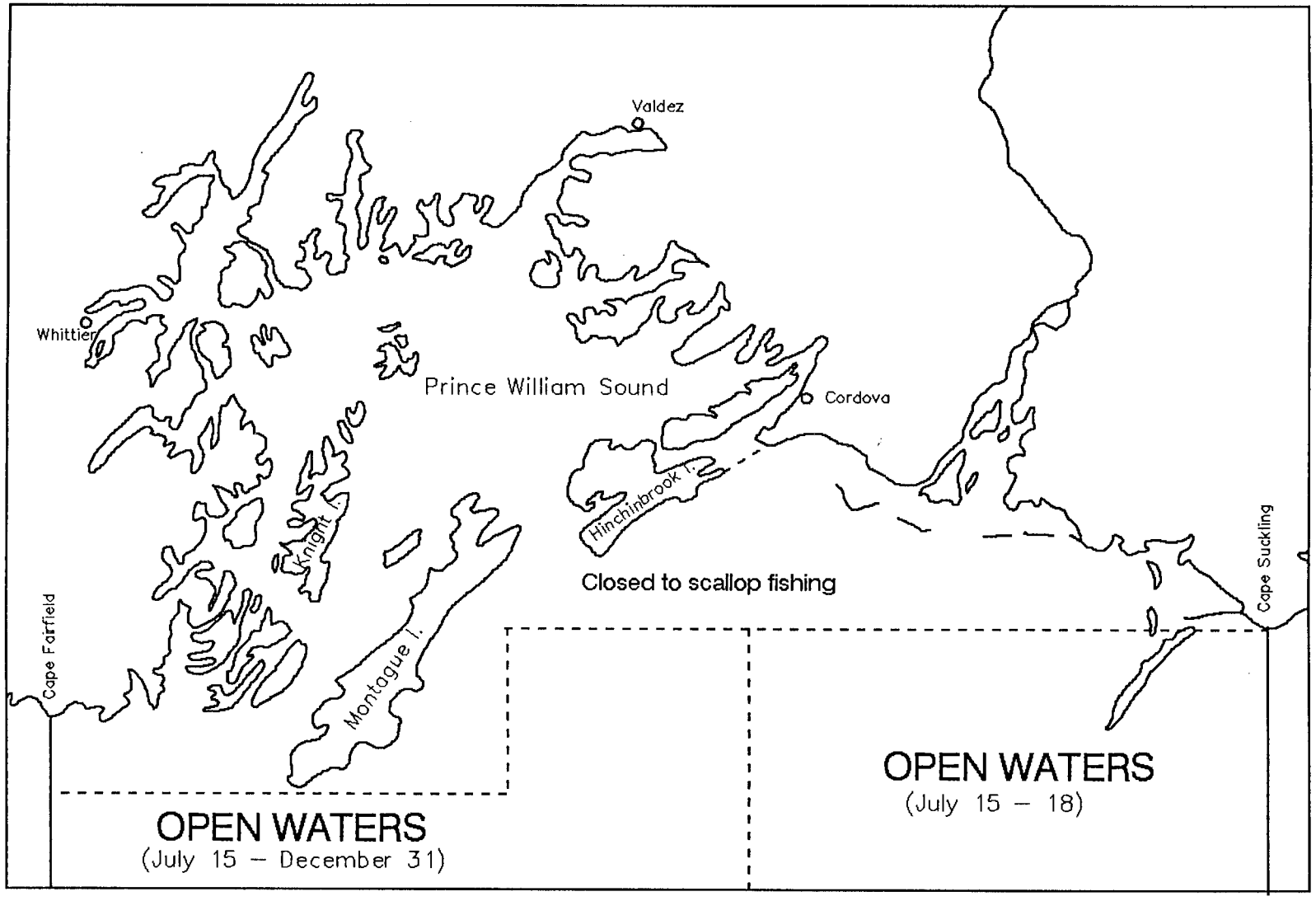

Figure 9. Prince William Sound scallop fishing areas in 1993.

Appendix A. Prince William Sound Area historical Tanner crab catch in pounds, by season 1968 - 1995.

Season	Inside	Outside	Total	Vessels	Lndgs	% Recruit	Avg. Wt.	# Crab
1968-69			1,235,613					
1969-70			1,284,597					
1970-71			4,159					
1971-72			7,788,498					
1972-73			13,927,868					
1973-74	1,658,000	8,500,000	10,158,000					
1974-75	1,187,000	2,667,000	3,854,000					
1975-76	3,322,482	3,810,262	7,132,744					

	Northern	Hinchinbrook	Western	Eastern						
1976-77(1)	782,048	766,650	701,725	70,925	2,321,348	23	316			
1977-78	994,721	1,161,831	2,079,549	570,573	4,806,674	38	591		2.2	2,184,852
1978-79	649,977	708,562	2,248,545	3,443,471	7,050,555	51	783		2.1	3,357,408
1979-80	140,228	332,583	1,462,059	4,057,847	5,992,717	49	561		2.0	2,996,359
1980-81	152,196	812,352	1,561,207	250,076	2,775,831	30	304		2.1	1,321,824
1981-82	351,139	722,834	1,503,253	288,425	2,865,651	29	216		--	-----
1982-83	471,422	31,447	921,663	45,308	1,469,840	40	304		2.1	699,924
1984 (2)	Closed	Closed	Closed	No Effort	0	0	0	--	--	-----
1985	Closed	Closed	No Effort	No Effort	0	0	0	--	--	-----
1986	137,720	236,241	160,829	587	535,377	14	35	26	2.1	254,941
1987	152,834	222,052	196,246	0	571,132	23	65	51	2.1	271,968
1988	55,929	226,509	191,654	0	474,092	21	46	34	2.1	225,758
1989	Closed	Closed	Closed	Closed	0	0	0	--	--	-----
1990	Closed	Closed	Closed	Closed	0	0	0	--	--	-----
1991	Closed	Closed	Closed	Closed	0	0	0	--	--	-----
1992	Closed	Closed	Closed	Closed	0	0	0	--	--	-----
1993	Closed	Closed	Closed	Closed	0	0	0	--	--	-----
1994	Closed	Closed	Closed	Closed	0	0	0	--	--	-----

(1) New districts established and first season of the minimum legal size.

(2) Calendar year season established.

Appendix B. King crab catch in pounds, Prince William Sound Management Area, 1960 - 1995.

Year/Season	Total Pounds all specie
1960	246,965
1961	236,081
1962	31,478
1963	43,569
1964	14,028
1965	5,500
1966	11,000
1967	41,800
1968	200,000
1969	48,100
1970	94,300
1971	144,200
1972	296,200
1973	207,916
1974	85,379
1975	53,423
1976-77	17,087
1977-78	86,595
1978-79	114,000

	S P E C I E S			Avg. Wt.	Total		
Seasons	Red	Blue	Brown	Brown	Pounds	Vessels	Landings
1979-80	52,026	13,662	0		65,688	18	109
1980-81	32,433	7,282	20		39,735	14	65
1981-82	25,358	5,634	0		30,992	11	43
1982-83	30,809	10,433	147,016	9.7	188,258	31	187
1983-84	16,467	5,324	50,535	8.8	73,226	18	69
1984-85	235	closed	40,232	--	40,467	4	14
1985-86	closed	closed	51,800	5.8	51,800	4	11
1986-87	closed	closed	65,674	6.1	65,837	4	11
1987-88	closed	closed	68,270	6.6	68,270	4	15
1988-89	closed	closed	48,442	6.6	48,442	5	14
1989-90	closed	closed	closed	--	0	0	0
1990-91	closed	closed	2,180	--	2,180	2	2
1991-92	0	0	780	--	780	1	1
1992-93	closed	closed	closed	--	0	0	0
1993-94	closed	closed	closed	--	0	0	0
1994-95	closed	closed	**		**	1	**

(**) Harvest data is confidential due to the limited number of participants.

Appendix C. Prince William Sound Area Dungeness crab catch, 1960 - 1994.

Year	Copper River Pounds	Lndgs.	Vessels	# Crab	Avg. Wt.	Percent Recruits	Orca Inlet Pounds	Vessels	Northern District Pounds	Lndgs.	Vessels	Total Pounds
1960	—	—	—	—	—	—	1,524,326	—	—	—	—	1,524,326
1961	—	—	—	—	—	—	990,242	—	—	—	—	990,242
1962	—	—	—	—	—	—	1,353,190	—	—	—	—	1,353,190
1963	—	—	—	—	—	—	1,216,846	—	—	—	—	1,216,846
1964	—	—	—	—	—	—	1,290,929	—	—	—	—	1,290,929
1965	—	—	—	—	—	—	1,240,372	—	—	—	—	1,240,372
1966	—	—	—	—	—	—	999,341	—	—	—	—	999,341
1967	—	—	—	—	—	—	NO DATA AVAILABL	—	—	—	—	NO DATA AVAILABL
1968	—	—	—	—	—	—	579,279	—	—	—	—	579,279
1969	336,696	—	—	—	—	—	541,822	—	—	—	—	878,518
1970	78,223	—	—	—	—	—	660,411	—	—	—	—	738,634
1971	78,848	—	—	—	—	—	430,976	—	—	—	—	509,824
1972	437,865	—	—	—	—	—	286,808	—	—	—	—	724,673
1973	458,613	—	—	—	—	—	347,764	—	—	—	—	806,377
1974	290,149	—	—	—	—	—	269,015	—	—	—	—	559,164
1975	654,410	—	—	—	—	—	163,631	—	—	—	—	818,041
1976	254,933	—	4	—	—	—	35,399	3	—	—	—	290,332
1977	506,751	—	4	—	—	—	228,858	23	—	—	—	735,609
1978	1,319,451	—	12	—	—	—	648,439	34	49,571	—	17	2,053,461
1979	504,770	—	19	—	—	—	123,245	32	20,924	—	16	652,924
1980	659,667	—	10	—	—	—	CLOSED	—	31,152	—	5	690,819
1981	1,503,574	202	18	—	—	25	CLOSED	—	5,683	11	5	1,509,257
1982	757,911	139	16	332,417	2.2	26	CLOSED	—	4,221	4	2	762,182
1983	379,094	86	9	184,026	2.1	49	CLOSED	—	511	14	2	379,605
1984	826,778	88	10	413,394	2.0	92	CLOSED	—	150	2	2	826,938
1985	1,006,196	124	17	483,748	2.1	63	CLOSED	—	1,233	5	1	1,007,429
1986	1,090,477	105	16	531,940	2.1	58	CLOSED	—	0	—	—	1,090,477
1987	887,713	92	13	438,974	2.0	34	CLOSED	—	5,461	2	2	893,174
1988	602,969	48	8	298,569	2.0	52	CLOSED	—	0	—	—	602,969
1989	635,976	43	9	326,226	2.0	25	CLOSED	—	0	—	—	635,976
1990	397,913	63	17	196,266	2.0	36	CLOSED	—	0	—	—	397,913
1991	70,259	32	14	39,033	1.8	62	CLOSED	—	0	—	—	70,259
1992 (1)	2,458	5	2	1,229	2.0	n/a	CLOSED	—	0	—	—	2,458
1993	SEASON CLOSED											
1994	SEASON CLOSED											

(1) Spring season only.

Appendix D. Pot shrimp harvest, Prince William Sound Management Area, 1960 - 1994.

Year	Vessels	Landing	WEIGHT (lb) Spot	Coonstripe	Other	Total [1] Whole Wt.
1960						4,988
1961						---
1962						3,576
1963						1,101
1964						4,248
1965						4,356
1966						---
1967						749
1968						6,866
1969						5,146
1970						19,776
1971						13,073
1972						6,949
1973						6,370
1974						24,978
1975						4,150
1976						2,410
1977						7,516
1978	9	17	N/A	N/A	N/A	15,466
1979	17	98	N/A	N/A	N/A	52,208
1980	23	155	84,787	5,174	67	90,028
1981	51	509	153,017	20,055	465	173,537
1982	57	397	205,746	7,250	784	213,781
1983	71	646	198,719	14,119	583	213,420
1984	79	513	198,729	7,911	640	207,280
1985	78	528	271,928	3,919	860	276,707
1986	80	540	286,105	3,715	812	290,632
1987	86	498	265,707	3,795	151	269,653
1988	76	433	191,630	764	48	192,442
1989	33	69	28,884	431	0	29,315
1990	23	59	36,378	358	0	36,737
1991	15	45	17,302	278	0	17,580
1992	C L O S E D					
1993	C L O S E D					
1994	C L O S E D					

[1] Catches converted from tail weight to whole weight using a conversion factor of 2.

Appendix E. Trawl shrimp harvest, Prince William Sound Management Area 1972 - 1994.

Year	Vessels	Pounds
1972		5,153
1973		4,243
1974		1,345
1975		26,961
1976		134,115
1977		170,757
1978	8	440,684
1979	4	634,518
1980	6	557,328
1981	4	70,560
1982	9	346,517

			WEIGHT (lb)				
Year	Vessels	Landings	Pink	Sidestripes	Other	Deadloss	Total
1983	13	46	420,275	1,058	2,345	—	423,678
1984	14	55	1,292,643	8,842	1,155	—	1,302,640
1985	6	44	432,514	15,696	440	—	448,650
1986	3	44	218,156	27,701	13	—	245,870
1987	2	109	275	95,043	440	—	95,758
1988	4	99	497	111,898	52	—	112,447
1989	*	*	*	*	*	—	*
1990	4	89	3,348	105,795	15	18,303	127,461
1991	5	67	3,453	84,483	193	51,429	139,558
1992	5	70	651	196,467	28	49,097	246,243
1993	7	72	23	190,976	51	55,140	246,190
1994	6	47	749	85,980	0	24,134	110,863

(*) Catch data is confidential due to the small number of participants.

Appendix F. Razor clam harvest in pounds, Prince William Sound Area, 1960 - 1994.

Year	COMMERCIAL Diggers	Pounds	NON - COMMERCIAL Diggers	Pounds
1960		433,930		
1961		261,628		
1962		208,698		
1963		86,340		
1964		39,275		
1965		86,477		
1966		27,063		
1967		98,446		
1968		72,806		
1969		26,887		
1970		27,909		
1971		37,972		
1972		30,326		
1973		30,318		
1974		29,747		
1975		15,443		
1976		1,516		
1977	11	2,160		
1978	54	29,865		
1979	26	12,904		
1980	21	5,881		
1981	7	28,970		
1982	12	15,275		
1983	41	124,835		
1984	41	168,426		
1985	25	60,274	37	4,930
1986	17	13,122	38	4,831
1987	12	40,954	83	6,225
1988	4	6,766	52	2,768
1989	No Effort	0	50	2,903
1990	"	0	50	2,641
1991	"	0	77	1,484
1992	"	0	92	2,403
1993	Confidential	Confidential	37	1,131
1994	"	0	28	459

1. A permit is required to harvest razor clams from the Copper River Delta for personal use, sport, or subsistence.